

What is claimed is:

1. An opening and closing device comprising:

a stator having a stator cam;

5 a rotor having a rotor cam urged to be in contact with the stator cam by a rotor spring;

a reverse-rotor having a reverse-rotor cam urged to be in contact with the stator cam by a reverse rotor spring; and,

a releaser having a release cam and being movable along an axis;

10 so that when the releaser moves along the axis, the release-cam presses against the reverse-rotor cam of the reverse-rotor, to cause said device to open.

2. The opening and closing device as defined in Claim 1, wherein the stator cam is one of a plurality of stator cams, and the rotor cam is pressed to a first of said stator cams which is inclined and the reverse-rotor cam is pressed to a second of said stator cams which is more inclined than said first of said stator cams when the device is closed.

15 3. The opening and closing device as defined in Claim 1, wherein the reverse-rotor comes into contact with the rotor when the device is opened.

20 4. The opening and closing device as defined in Claim 1, wherein the rotor is pressed toward a closing direction on the stator at a first position where the rotor cam and the reverse-rotor cam contact to the stator cam when the device is closed, and the rotor is pressed toward an opening direction reverse to the closing direction on the stator at a second position where the rotor cam and the reverse-rotor cam contact to the stator cam when the device is closed.

25 5. The opening and closing device as defined in Claim 1, wherein the reverse-rotor pushes the rotor toward a closing direction when the device is closed, and the

reverse-rotor pushes the rotor toward an opening direction when the device is opened.

6. The opening and closing device as defined in Claim 1, wherein the reverse-rotor is rotatable to the rotor within a predetermined angle.

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7. An opening and closing device comprising:

a rotary case in substantially tubular shape;

a fix cover covering an end of the rotary case;

10 a stator, a rotor, and a rotor spring in coil shape inside the rotary case and aligned along substantially a same axis;

a releaser accommodated in an inner periphery of the stator and the rotor;

15 a fix shaft with an end thereof connected to the fix cover and another end thereof connected to the stator;

a reverse-rotor accommodated in an inner periphery of the rotor; and

15 a reverse-rotor spring, which is accommodated in an inner periphery of the rotor spring, for pushing the reverse rotor,

wherein the stator has a first stator cam and a second stator cam facing the reverse rotor,

20 wherein an inclined angle or a tip portion of the first stator cam is different from an inclined angle of a tip portion of the second stator cam.

25 8. The opening and closing device as defined in Claim 7, wherein the tip portion of the first stator cam is inclined in an opposite direction to that of the second stator cam, and the inclined angle of the tip portion of the first stator cam is steeper than that of the second stator cam.

9. The opening and closing device as defined in Claim 7, wherein the first stator cam is formed inside an inner periphery of the second stator cam.

10. The opening and closing device as defined in Claim 7,

wherein the rotor has a rotor cam at an end face thereof facing the stator cam, and the reverse-rotor has a reverse-rotor cam at an end face thereof facing the stator cam,

5 wherein the rotor cam comes into contact with the second stator cam, and the reverse-rotor cam comes into contact with the first stator cam.

11. The opening and closing device as defined in Claim 7,

wherein the rotor has a groove portion on an inner periphery thereof and the 10 reverse-rotor has a protrusion on an outer periphery thereof,

wherein rotation of the reverse-rotor with respect to the rotor is restricted by engaging the protrusion with the groove portion.

12. The opening and closing device as defined in Claim 7, wherein the rotor spring

15 pushes the rotor cam toward the second stator cam, and the reverse-rotor spring pushes the reverse-rotor cam toward the first stator cam.